Amendments to the Claims

- Please cancel claims 1, 3, 6-21, 28, and 36-38 (claims 2, 4-5, 22-27, and 29-35 have been previously canceled).

- Please enter and consider new claims 39-62.

The listing of claims below replaces all prior versions, and listings, of claims in the above-identified application:

Listing of Claims

1.-38. **(Canceled)**

39. **(New)** A method of detecting a gas phase material comprising:

locating a sensor outside of a reaction chamber, the sensor comprising:

a first electrode and a second electrode;

a detection surface extending between the first electrode and the second electrode; and

a detector operatively connected to the first electrode and the second electrode;

exposing the detection surface to a gas phase material escaping from the reaction chamber, wherein the gas phase material forms an electrically conductive film on the detection surface;

detecting the gas phase material from a change in conductivity between the first electrode and the second electrode with the detector; and

generating an alert based on the detection of the gas phase material.

40. **(New)** The method according to claim 39, wherein the gas phase material comprises ruthenium.

41. **(New)** The method according to claim 40, wherein the gas phase material comprises ruthenium tetraoxide.

42. **(New)** The method according to claim 39, wherein the detection surface is selected such that the electrically conductive film preferentially deposits on the detection surface.

43. **(New)** The method according to claim 42, wherein selection of the detection surface comprises selecting a detection surface comprising polypropylene.

44. **(New)** The method according to claim 39, wherein generating the alert comprises alerting personnel in an area surrounding the chamber of a potential hazard.

45. **(New)** A method of detecting a gas phase material comprising:

providing a sensor outside of, but in proximity to, a reaction chamber, the sensor comprising a first electrode and a second electrode, a detection surface extending between the first electrode and the second electrode, and a detector operatively connected to the first electrode and the second electrode, wherein the detection surface is not electrically conductive;

exposing the sensor to a gas phase material comprising ruthenium escaping from the chamber, wherein an electrically conductive film comprising ruthenium forms on the detection surface;

detecting electrical conductivity of the electrically conductive film between the first and second electrodes with the detector; and

generating an alert based on the detection of the electrical conductivity of the electrically conductive film.

46. **(New)** The method according to claim 45, wherein the detection surface is selected such that the electrically conductive film comprising ruthenium preferentially deposits on the detection surface.

47. **(New)** The method according to claim 45, wherein the detection surface comprises a polymer.

48. **(New)** The method according to claim 45, wherein the detection surface comprises polypropylene.

49. **(New)** The method according to claim 45, wherein the detection surface comprises glass.

50. **(New)** A method of detecting a gas phase material comprising:

providing a sensor proximate a reaction chamber, the sensor comprising a first electrode and a second electrode, a detection surface extending between the first electrode and the second electrode, and a detector operatively connected to the first electrode and the second electrode;

heating the detection surface above ambient temperature;

exposing the detection surface to a gas phase material comprising ruthenium escaping from the chamber, wherein an electrically conductive film comprising ruthenium forms on the detection surface;

detecting the electrically conductive film comprising ruthenium from a change in conductivity between the first and second electrodes with the detector; and

generating an alert based on the detection of the electrically conductive film comprising ruthenium.

51. **(New)** The method according to claim 50, wherein the detection surface is selected such that the electrically conductive film comprising ruthenium preferentially deposits on the detection surface.

52. **(New)** The method according to claim 51, wherein selection of the detection surface comprises selecting a detection surface comprising polypropylene.

53. **(New)** The method according to claim 50, wherein heating the detection surface comprises heating the detection surface up to about 100°C or less.

54. **(New)** A deposition system comprising:

a reaction chamber for use in semiconductor processing; and

a sensor located outside of the reaction chamber, the sensor operable to detect a gas phase material that escapes from the chamber, the sensor comprising:

a first electrode and a second electrode;

a detection surface extending between the first electrode and the second electrode, wherein the detection surface comprises a material on which an electrically conductive film preferentially deposits from the gas phase material; and

a detector measuring electrical conductivity between the first and second electrodes, where the detector generates an alert when the electrically conductive film forms on the detection surface between the first and second electrodes.

55. **(New)** The system according to claim 54, wherein the gas phase material comprises ruthenium.

56. **(New)** The system according to claim 54, wherein the detection surface comprises a polymer.

57. **(New)** The system according to claim 54, wherein the detection surface comprises polypropylene.

58. **(New)** The system according to claim 54, wherein the detection surface comprises glass.

59. **(New)** The system according to claim 54, wherein the detector comprises an electronic circuit capable of detecting a change in electrical conductivity between the first and second electrodes.

60. **(New)** A deposition system comprising:

a reaction chamber for use in depositing film layers by chemical vapor deposition; and

a sensor located outside of the chamber and operable to detect a gas phase material comprising ruthenium escaping from the chamber, the sensor comprising:

a first electrode and a second electrode;

a detection surface extending between the first electrode and the second electrode, wherein the detection surface comprises a material on which an electrically conductive film comprising ruthenium preferentially deposits from the gas phase material comprising ruthenium;

a heating apparatus capable of providing thermal energy to the detection surface; and

a detector measuring electrical conductivity between the first and second electrodes, where the detector generates an alert when the electrically conductive film comprising ruthenium forms on the detection surface.

61. **(New)** The system according to claim 60, wherein the detection surface comprises a polymer.

62. **(New)** The system according to claim 60, wherein the detection surface comprises glass.